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Depression and alcohol use among the Dutch residential home elderly: Is there a shared vulnerability?

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Abstract

The purpose of this article is to investigate whether data from an older population sample would support the co-occurrence between depression and (problematic) alcohol use found in the general population and in clinical samples. Additionally, important predictors concerning these phenomena are identified in this population, by interviewing 156 inhabitants of five residential homes (mean age 84 years), using several questionnaires. The results showed that there is no link present between depression and alcohol use in this very old, mostly female population. Our results found a relation between the personality traits extraversion and openness to experience with both depression as well as alcohol use. Neuroticism was only related to depressive symptoms. Chronic diseases was related to non-alcohol use and parental problem drinking was found to be a risk factor for late life problem drinking. Future studies should aim at developing screening instruments for alcohol use in this population and, because of the importance of the personality traits, aim at developing or adapting of psychotherapeutic interventions fit for this population.

Keywords: *Depression, alcohol use, older adults, residential homes, personality*

Introduction

Despite the increasing focus on the high co-occurrence of depression and alcohol use (Merikangas and Gelernter 1990; Regier et al. 1990; Kessler et al. 1994, 1997; Grant and Harford 1995; Swendsen and Merikangas 2000), relatively little research has been undertaken to examine whether a link between depressive symptoms and drinking behaviour is also present in later life (Speer and Bates 1992; Scholz et al. 1995; Schutte et al. 1998;

Atkinson 1999). To the best of our knowledge, we are the first to investigate this association in a general residential home population with a mean age of 84 years.

Most of the studies on the co-occurrence of depression and alcohol use have shown that it is a rather complex association. First of all it is not clear whether they are related or not (as both disorders are common, frequent co-occurrence is possible without a link), and second, when they are, whether their relationship is causal, meaning that one causes the other (Dixit and Crum 2000; Swendsen and Merikangas 2000) and third, the direction of a possible causal relationship is not clear. It is possible that alcohol use causes depression, or that depression causes alcohol use, or it could be that both are caused by a third factor. In order to further explore this relationship, more empirical data are needed.

A recent study on the underlying causes of the co-occurrence between depression and alcohol use showed that depressed patients engaged in more drinking, cope with the depression (Holahan et al. 2004). In addition, this same study has found that depressed patients experienced more negative life events and less family support than as reported by the community control group. Moreover, these underlying life context vulnerabilities explained the risk for depressed individuals in relying on alcohol to cope.

Alcohol problems or use in the elderly are generally accepted to be less prevalent than in younger age groups (Adams et al. 1990). Therefore it could be assumed that, due to this age-related decline, there is no link between depression and alcohol use in later life. However, the few studies conducted on this subject have found co-morbid depression and alcohol abuse to be common among elderly patients (Saunders et al. 1991; Speer and Bates 1992; Blixen et al. 1997; Graham and Schmidt 1999) and outpatients (Callahan et al. 1994). However, no results are known about this association within the very old and frail population of elderly living in residential home.

Older drinkers remain vulnerable to the adverse effects of alcohol. Rates of physical illness among elderly problem drinkers are high (Hurt et al. 1998) and elderly problem drinkers are more likely to present with non-specific symptoms such as falls, self-neglect, incontinence and malnutrition, which makes them very difficult to detect. The purpose of the present study was to investigate whether data from a residential home inhabitants sample (mean age 84 years) would support the link between depression and alcohol in later life. We wanted to identify important predictors of these phenomena in this specific population. As one of these predictors, we investigated the associations with the Big Five Personality Traits (Costa and McCrae 1992). In younger age samples, evidence was found for a positive association of alcoholism with neuroticism and a negative association with agreeableness and conscientiousness (Martin and Sher 1994; Malouff et al. 2007). In summary, it is reasonable to hypothesize that within this population of the oldest of the old people, a significant association between alcohol use and depression still exists and the long-term vulnerability to (problematic) alcohol use and depression in the make-up of personality traits remains.

Method

Subjects and procedure

The Boards of Directors of five residential homes for the elderly in Amsterdam and in the surrounding area were approached in the second half of 2004 for participation in this study. After agreement of the Boards of Directors, all residents of the homes received a letter

in which they were notified of the study. Inclusion criteria for this study were: (1) age higher than 65, (2) living in the residential care department (nursing home elderly living in the residential homes were not approached) and (3) normal cognitive functioning. The elderly residents who were severely cognitively impaired or had a diagnosis of dementia were not asked for participation (selection was conducted by the staff of the residential home). Within 2 weeks, the elderly were personally approached by the interviewers and asked whether they wanted to participate in the study. If they wished to take part, they were asked for informed consent. Data were collected in a face-to-face interview, carried out in the home of the elderly, by specially trained master-level clinical psychology students. The interview lasted about one and a half hours. Questionnaires on depression, limitations in daily functioning, chronic illnesses, personality characteristics, coping with depression and, of course, alcohol consumption were administered. These self-report questionnaires were read out loud and administered by the interviewer.

The remaining eligible 381 inhabitants were approached to participate in the study, of whom 170 (44.6%) agreed. A total of 211 subjects did not wish to participate for various reasons: Illness ($N=18$; 4.7%); deafness ($N=21$; 5.5%); 125 were not interested/motivated (32.8%); and 47 could not be contacted (12.3%).

The remaining 170 respondents were screened on cognitive functioning using the Mini Mental State Examination (MMSE; Folstein et al. 1975). Twelve subjects who scored below the cut-off point of 17 were excluded from the study. These elderly reported severe cognitive impairment. Due to incomplete data, another two respondents were lost for further analysis. This procedure resulted in a study sample of 156 (40.9%) respondents, of whom 44 were men (28.2%) and 112 were women (71.8%). The age of the respondents ranged between 65 and 102 years, with a mean age of 84 ($SD=6.34$). Most of the residents were not or no longer married ($N=118$, 75.6%). Sixty-nine percent ($N=107$) had a low level of education and nearly 85% ($N=132$) had one or more chronic diseases. Demographic characteristics are shown in Table I.

Measurements

Depressive symptomatology was measured with the Dutch version of the Center for Epidemiological Studies Depression scale (Radloff and Teri 1986; CES-D; Beekman et al. 1994), a 20-item self-report questionnaire on depressive symptomatology experienced during the past week. Respondents were asked how often they had experienced each symptom during the previous week. Items were scored on a four-point scale, ranging from zero (no symptoms) to three (most of or all of the time). The total CES-D score ranges from zero (no symptoms) to 60 (maximum number of symptoms). A score of ≥ 16 has generally been used as indicative for clinically relevant depressive symptoms (Berkman et al. 1986). The psychometric properties of the Dutch version of the CES-D are good (Crohnbach's alphas ranging from 0.80 to 0.90; Beekman et al. 1994). In our study, a Crohnbach's alpha of 0.81 was found. Because of the emphasis on affective items in the scale, the overlap with symptoms of physical illness is minimal (Beekman et al. 1994; Lewinsohn et al. 1997; Haringsma et al. 2004).

Alcohol use was measured by asking respondents how many drinks they had taken each day of the past week, and summing up the total of all drinks in the past week. When an elderly had more than 15 alcoholic drinks during the past week, the respondent was coded as a heavy drinker.

Table I. Selected characteristics of 156 inhabitants of residential homes in the Netherlands.

Demographic characteristics	N	%
Gender		
Male	44	28.2
Female	112	71.8
Married		
Yes	38	24.4
No	118	75.6
Children		
Yes	136	87.2
No	20	12.8
Education		
Low	107	68.6
High	49	31.4
Religious		
Yes	69	44.2
No	87	55.8
Chronic illnesses		
0	24	15.4
1–3	78	50.0
≥4	54	34.6
Age	$M = 84.2$	$SD = 6.3$
Alcohol drinkers	81	51.9
Alcoholic drinks in past week	$M = 4.5$	$SD = 7.9$
Heavy drinkers, ≥15 a week	11	7.1
Depressive Symptoms (CES-D)	$M = 10.3$	$SD = 8.8$
CES-D > 16	35	22.4
<i>Life events</i>		
Death of close person	48	30.5
Illness	31	19.7
Fight/Relationship problems	8	5.0
Financial problems	5	3.1
Losses/Robbery/Others	10	6.3
Parental depression	30	19.1
Parental problem drinking	9	5.7
NEO-Neuroticism	4.0	1.9
NEO-Extraversion	4.4	2.0
NEO-Openness to experience	4.6	2.2
NEO-Agreeableness	5.6	2.1
NEO-Conscientiousness	4.7	2.3

Covariates

Family history of depression and problem drinking, parental depression and parental problem drinking was measured by asking the respondents if either of their (biological) parents ever had a depression and in a separate question, if either of their (biological) parents ever had a problem with alcohol. This single-question method has been used in several large-scale epidemiological surveys (Greenfield et al. 1993; Mathew et al. 1993; Cuijpers et al. 1999; Cuijpers et al. 2007). In a comparison between the single-question method and the Family History Research Diagnostic Criteria (FH-RDC), which requires at least one alcohol-related problem in addition to parental problem drinking, we found good agreement in assessing mental disorder ($\kappa = 0.83$); the single-question method introduced only a small,

non-significant downward bias when it comes to assessing the risk for psychiatric disorders in children of alcoholic probands (Cuijpers and Smit 2001).

Life events were surveyed in five specific questions by asking if the respondent had experienced a serious life event during the past 12 months. The five life events addressed were: (1) Death of someone close, (2) illness, or someone close having a serious illness, (3) having a fight or relationship problems, (4) serious financial difficulties, (5) losing money or other valuables through accident or robbery. The questions were scored with a yes/no response format. In the analyses, the five life events are entered as individual covariates.

Personality characteristics were assessed with the NEO-FFI Personality Inventory (Costa and McCrae 1992), Dutch version (Hoekstra *et al.* 1996). The NEO-FFI results in a profile of the personality consists of 60 statements. For each statement, the respondent indicates on a five-point scale how much this is applicable to him or herself. The scores for each of the five scales are recoded into nine categories, with a normal distribution, indicating the relative score of an individual compared to the general population. The five dimensions of personality measured by this instrument are Neuroticism (N), Extraversion (E), Openness to Experience (O), Agreeableness (A) and Conscientiousness (C). The reliability coefficients (Cronbach's alpha) we found in our study for the five scales were the following: Neuroticism, 0.76; extraversion, 0.77; openness, 0.63; agreeableness, 0.64 and conscientiousness, 0.74.

Demographic variables assessed included: Age, gender, being married (yes/no or no longer), number of children, education level (lower *vs.* higher) and being religious (yes/no).

The number of chronic illnesses was calculated by summing all diseases reported by the respondent to be present, using a list of the 25 most common chronic diseases. (Central Bureau of Statistics 1989). For the present study, number of chronic diseases was indicated as 0 = no disease, 1 = one to three and 2 = four or more.

Analyses

A bivariate analysis, using Pearson's correlation coefficient, was first carried out to examine the relationship between level of depressive symptoms and number of alcoholic drinks in the past week in the study sample of elderly living in residential homes. Next to this, a Chi-square test was performed to investigate whether there was a relationship between a clinical level of depressive symptoms and being a problem or heavy drinker. An unpaired Students *t*-test was performed to compare the mean number of alcoholic drinks in the past week of the elderly with depressive symptoms to the non-depressive.

Next, we conducted several series of multiple regression analyses to examine the relationship between the level of depressive symptoms and the number of alcoholic drinks, while controlling for important predictors. In the first series of regression analyses, we used the level of depressive symptoms as the dependent variable, and consecutively entered three groups of variables as predictors. In the first regression analysis, we entered the number of alcoholic drinks as a predictor of depressive symptoms. In the second analyses, we entered the number of alcoholic drinks as predictor, while controlling for demographic characteristics (gender, age, marital status, having children, educational level, religiousness). In the third analyses, we entered the number of alcoholic drinks and the demographic characteristics in the model, and also included several variables that may be causally related to alcohol use and depression (number of chronic illnesses, life events, parental depression, parental problem drinking) and in the fourth model investigated, the effects of the

personality characteristics on the association between alcoholic drinks and the level of depressive symptoms.

Because the direction of a possible causal relationship between depression and alcohol use is not known, we conducted the same multiple regression analyses once more, but this time we used the number of alcoholic drinks in the past week as the dependent variable, while the level of depressive symptoms was entered as a predictor in all four regression models.

Results

Nearly half of our study sample ($N=77$; 49.4%) used no alcoholic drinks during the week before the measurement interview. The mean number of alcoholic drinks during the past week was 4.6 ($SD=7.9$) and the median is 1 alcoholic drink. Eleven (7%) elderly were categorised as heavy drinkers (≥ 15 alcoholic drinks a week). At time of measurement, 35 (22.4%) had a clinical significant level of depressive symptoms ($CES-D > 16$). The mean score on the CES-D was 10.3 ($SD=8.8$) and 18 (11.5%) reported no depressive symptoms. An examination of the extent of depressive symptomatology experienced during the past week and the number of alcoholic drinks in the past week revealed no correlation, using Pearson's correlation coefficient, $r=-0.01$, ($p=0.88$). We performed a Chi-square test on the relationship between depressive symptoms and problematic or excessive alcohol consumption. As Table II shows, there was no significant difference in number of problem drinkers within the group with and without depressive symptoms ($\chi^2_{1,156}=0.123$; $p=0.534$).

In addition to this, we performed an unpaired Students *t*-test comparing the number of alcoholic drinks of elderly with a clinical level of depressive symptoms ($CES-D > 16$; $M=4.47$, $SD=11.18$) with the elderly not depressed ($M=4.56$, $SD=6.78$). Results showed that there is no significant difference in mean level of alcoholic drinks between depressed and not depressed residential home elderly ($t_{154}=0.06$, $p=0.95$; Table II).

Next, we examined the relationship between CES-D scores and number of alcoholic drinks in multiple regression analyses, while controlling for important predictors. In the first step, only the number of alcoholic drinks in the past week was entered as a predictor. In the second step, both number of alcoholic drinks and demographic variables were entered as predictors. In the third step, the following variables were added as predictors: Number of chronic illnesses, life events, parental depression, parental problem drinking and finally in the fourth model, the NEO-FFI scales measuring personality.

The results of these analyses, in which we used the CES-D scores as the dependent variable are presented in Table III. In the first three models, no significant association between the predictors and level of depressive symptoms were found. In the fourth model

Table II. Distribution of heavy drinkers among residential home elderly with and without depressive symptoms.

clinical level of depressive symptoms	Heavy drinker?		Mean number of alcoholic drinks during past week
	No	Yes	
No	112 (92)	9 (7)	4.56 (6.78)
Yes	33 (94)	2 (6)	4.47 (11.18)
		$\chi^2=0.123$; $p=0.534$	$t_{154}=-0.06$; $p=0.95$

($F(20, 155) = 16.668$, $p = 0.000$), including the personality characteristics, a significant effect of level of education (β , -0.163 ; $p = 0.033$), religious affiliation (β , -0.198 ; $p = 0.006$), neuroticism (β , 0.560 ; $p = 0.000$), extraversion (β , -0.170 ; $p = 0.028$) and openness to experience (β , 0.156 ; $p = 0.039$) on the level of depressive symptoms was found. Indicating that a low level of education, no religious affiliation, a high level of neuroticism, a low level of extraversion or being more open to experiences are associated with a higher level of depressive symptoms in a residential home population.

Subsequently, we used the number of alcoholic drinks as the dependent variable and in the first step only the level of depressive symptoms (CES-D scores) was entered as predictor. In the second step, both CES-D scores and demographic variables were entered as predictors. In the third step, the variables number of chronic illnesses, life events, parental depression and parental problem drinking and finally in the fourth model the NEO-FFI scales were added as predictors.

The results of these analyses are presented in Table IV. In the first analysis no significant association was found. In the second model, association was significant ($F(7, 155) = 5.47$, $p = 0.00$) and this step showed a significant effect of gender (β , -0.280 ; $p = 0.001$), age (β , -0.239 ; $p = 0.003$) and education level (β , 0.209 ; $p = 0.008$) on the number of alcoholic drinks. Male gender, the younger elderly and a higher level of education increase the mean number of alcoholic drinks. In the third predictor-model ($F(15, 155) = 5.744$, $p = 0.00$); next to the effect of gender (β , -0.166 ; $p = 0.040$), age (β , -0.250 ; $p = 0.001$) and education

Table III. Standardised regression coefficients (beta) of selected predictors, in relation to CES-D scores (depressive symptoms), among elderly living in residential homes ($N = 156$).

Model/Variables	B			
	Model 1	Model 2	Model 3	Model 4
Alcoholic drinks	0.010	0.047	0.10	-0.034
Demographic variables				
Gender		-0.018	-0.027	0.005
Age		0.064	0.114	0.124
Marital status		-0.119	-0.139	-0.076
Children		0.058	-0.072	-0.026
Education level		-0.153	-0.160	-0.163*
Religious		-0.078	-0.115	-0.198**
Other predictors				
Chronic illnesses			0.127	0.070
Death of close person			0.146	0.046
Illness			0.071	0.004
Fight/Relationship problems			0.073	-0.015
Financial problems			0.008	-0.002
Losses/Robbery/Others			0.057	0.022
Parental depression			0.042	-0.059
Parental problem drinking			-0.072	-0.058
NEO-Neuroticism				0.560***
NEO-Extraversion				-0.170*
NEO-Openness to experience				0.156*
NEO-Agreeableness				-0.019
NEO-Conscientiousness				-0.003
$F(R^2)$		0.051	0.119**	0.468***

Note: B = Standardised Beta Coefficients.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table IV. Standardised regression coefficients (beta) of selected predictors, in relation to number of alcoholic drinks (predicting alcohol use), among elderly living in residential homes ($N=156$).

Model/Variables	B			
	Model 1	Model 2	Model 3	Model 4
Depressive symptoms	0.010	0.040	0.071	-0.035
Demographic variables				
Gender		-0.280***	-0.166*	-0.127
Age		-0.239***	-0.250***	-0.266***
Marital status		-0.117	-0.091	-0.085
Children		0.023	0.017	0.021
Education level		0.209**	0.207**	0.134
Religious		-0.077	-0.046	-0.101
Other predictors				
Chronic illnesses			-0.227***	-0.267***
Death of close person			-0.024	-0.021
Illness			-0.036	-0.016
Fight/Relationship problems			-0.142	-0.155*
Financial problems			0.043	0.048
Losses/Robbery/Other			0.109	0.081
Parental depression			0.181*	0.143
Parental problem drinking			0.284***	0.292***
NEO-Neuroticism				0.089
NEO-Extraversion				-0.207**
NEO-Openness to experience				0.182*
NEO-Agreeableness				0.097
NEO-Conscientiousness				0.081
$F(R^2)$		0.190***	-0.399***	0.460**

Note: B = Standardised Beta Coefficients.

* $p < 0.05$; ** $p < 0.01$; *** $p < .001$

level (β , 0.207; $p = 0.033$), the number of chronic illnesses (β , -0.227; $p = 0.003$), parental depression (β , -0.181; $p = 0.015$) and parental problem drinking (β , 0.284; $p = 0.000$) also showed a significant effect on the number of alcoholic drinks. One of the life events, fight/relationship problems, showed a trend in this step (β , -0.163; $p = 0.033$ $p < 0.1$), indicating a possible association. In the fourth regression model ($F(20, 155) = 2.844$, $p = 0.018$) gender ($p = 0.107$), level of education ($p = 0.084$) and parental depression ($p = 0.063$), were no longer significantly associated with the number of alcoholic drinks, but showed a trend. One or more chronic diseases (β , -0.267; $p = 0.001$), fight/relationship problems (β , -0.155; $p = 0.039$), parental problem drinking (β , 0.292; $p = 0.000$), a low level of extraversion (β , -0.207; $p = 0.008$) and being open to experiences (β , 0.182; $p = 0.017$) predicted alcohol use.

Discussion

Does the strong association between depression and drinking problems or alcohol use disorders persist into later life? We, in line with previous research, expected to confirm this research question (Saunders et al. 1991; Speer and Bates 1992; Blixen et al. 1997; Graham and Schmidt 1999). As one of the first in the residential home elderly population,

this cross-sectional study investigated this association and predictors of depressive symptoms and alcohol use.

In contrast to our hypothesis, no significant association was found between depression and alcohol use in this study population. In additional analyses, we did not find a difference in number of problem drinkers between the elderly with and without depressive symptoms. A possible explanation we did not give, in contrast to other studies who did find a significant association, is our study population. Saunders et al. (1991) only included men who had a history of alcohol problems in the past, and Graham and Schmidt (1999) included elderly patients discharged from a psychiatric hospital. Our study sample was derived from the general residential home population and as such they were very old and our sample consisted mostly of women who had never drunk alcohol. However, the result that no difference in number of problem drinkers was found between the elderly with and without depressive symptoms ascertains the assumption that in later life depression neither causes alcoholism nor affects drinking behaviour in non-alcoholic persons (Atkinson 1999).

With regard to factors associated with depressive symptoms the following predictors were found: Low-education level, religious affiliation and the personality characteristics high score on neuroticism, low score on extraversion and more open to experience. Alcohol use was found to be related to age, number of chronic illnesses, fight or relationship problems during the last year, parental problem drinking and the personality traits extraversion and openness.

We found negative relationships between age and number of chronic illnesses and alcohol use in later life. It seems to be that having a chronic illness is protective for alcohol consumption in this population. A logical explanation could be that elderly with one or more chronic illnesses use (more) medication and therefore less alcohol, knowing that alcohol consumption is not allowed in combination with most of the medicines taken. Our results are in contrast with other studies which found physical illness to be related to late-onset of alcoholism (Goldstein et al. 1996). The negative association with age is in line with the assumption that alcohol use declines with age.

A number of reasons explain this association, such as premature mortality among lifelong alcoholics, the tendency of many aging alcoholics to abstain from drinking, and underrecognition and underreporting by clinicians (Atkinson 2001) and, of course, physical illness and functional limitations related to aging urges elderly to stop drinking alcohol.

Our study supported the association between the personality traits extroversion and openness to experience and alcohol use and depressive symptoms in later life. Low extrovert or introvert people have difficulty in showing and talking about their feelings. People high on openness to experience are characterised by their adventurousness and have a vivid imagination and a stronger need for thrill seeking. These personality trait descriptions may explain the significant association with alcohol use and depressive symptoms in later life. We did find neuroticism to be related to depression in later life, not to alcohol use. Other studies did find a relation between high neuroticism and alcohol use. Neuroticism is a well-known risk factor for depression in later life (Caspi and Roberts 1999; Steunenberg et al. 2006). Our population is one of older women with functional limitations. These women do not drink and will not start with drinking in this old age. This would explain why neuroticism, a personality trait characterised by emotional instability, in this sample is related to depressive symptoms and not to alcohol use.

This study is rather unique in being one of the first investigating the association between depression and alcohol use in a representative sample of elderly living in a residential home. Some methodological limitations remain and the results of this study should be interpreted with caution. First, this study relies on cross-sectional data, which limits the possibility of

making causal inferences. Second, a considerable part of the approached population refused or was not able to participate in our study, which may have distorted the results. Another potential problem is that this study relied mostly on information obtained by interview and the reliability of gathering information may underestimate the prevalence of excessive alcohol use or because of the voluntary nature of inclusion of respondent probably some problem drinkers did not wish to participate. We used a simple method to measure alcohol use, which may have distorted the results. Not much is known about the validity and effectiveness of the standardised screening instruments for alcohol use in later life (O'Connell et al. 2004). Future research should aim at developing or adapting screening instruments for use in an elderly population. Ease of use, patient acceptability, sensitivity and specificity must all be considered when selecting a self-report alcohol screening instrument for use in elderly (O'Connell et al. 2004).

Providing quality psychiatric care to residential home residents is of major importance to general public health. Although our study did not ascertain an association between depression and alcohol use in a general residential home population, heavy drinking and problem drinking are common in later life, especially in men. Further studies are needed to unravel the association between depression and alcohol consumption, to identify groups who are at high risk for one of or co-occurrence of these disorders and finally, because of the important role of personality traits, future research should aim at developing or adapting to the elderly of psychotherapeutic interventions on alcohol use.

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